

2.0 Existing Transportation Conditions

This section addresses existing transportation conditions including roadway facilities, traffic operations, roadway geometry, structures, pavement, alternative modes, and other identified transportation elements. This information will be used to help identify existing deficiencies or substandard roadway elements. The Appendix contains a milepost log, cross-referenced to street and roadway names, and to city and/or county to enable the reader to locate facilities described in this document.

2.1 Overview of Existing Roadway

US-91 is generally classified as a rural major collector within the Idaho State Highway Plan with Type I access control. Major collectors carrying a mix of local and regional traffic between other arterials, have moderate heavy truck volumes, and also have a moderate level of direct land access in rural areas. Type I access allows for intersection spacing every quarter mile, approach spacing every 300 feet, and signal spacing every half mile.

The existing roadway section on the US-91 Corridor from Siphon Road to Sunnyside Road is 44 miles long. US-91 Table 2-1 lists the major characteristics for each roadway segment. Based on information contained in the ITD Highway Data Quest data system, the majority of US-91 is a Rural Major Collector; changes in functional classification are noted where applicable.

Table 2-1: Summary of Existing US-91 Characteristics

Begin Milepost to End Milepost (MP)	Roadway Segment	Characteristics
81.580 to 88.876	Siphon Road to Sheepskin Road	Two-lane roadway with shoulders varying from 4 to 8 feet wide. Siphon Road to Reservation Road (MP 83.577) is an Urban Principal Arterial. From MP 83.577 to 87.858 is a Rural Minor Arterial.
88.876 to 97.052	Sheepskin Road to South Blackfoot I-15 Interchange	Two-lane roadway with shoulders between 3 and 4 feet wide.
97.052 to 102.421	South Blackfoot Interchange to Airport Road	Two-lane section with shoulders varying from 0 to 4 feet wide. Transitions to a four lane with center turn lane urban section through the City of Blackfoot from Shilling Way to Airport Road. Urban Principal Arterial through the City of Blackfoot.
102.421 to 118.933	Airport Road to New Sweden Road	Two-lane section with shoulders varying from 0 to 5 feet wide. Section widens to four lanes with center turn lane in the Cities of Firth and Shelley.
118.933 to 125.175	New Sweden Road to Sunnyside Road	Two-lane section widening to four lanes at York Road (MP 122.866). Generally up to 4-foot wide shoulders. York Road to Sunnyside Road is an Urban Principal Arterial.

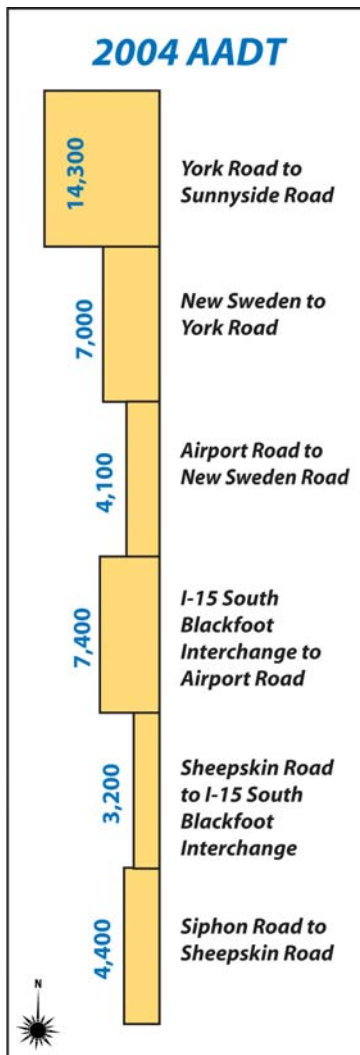
The Union Pacific Railroad runs parallel to US-91 for much of the corridor, beginning just north of Ballard Road. The US-91 highway right-of-way lies within the existing Union Pacific railroad right-of-way. Existing right-of-way widths were obtained from ITD Division of Planning and are summarized in Table 2-2. The approximate geographic location, based on mileposts contained in the ITD milepost log, is also shown.

Table 2-2: US-91 Right-of-Way

Milepost	Approximate Geographic Location	Right-of-Way Width
81.580 to 83.577	Siphon Road to Reservation Road	66 feet
83.577 to 97.052	Reservation Road to South Blackfoot Interchange	80 feet
104.266 to 111.9	North Blackfoot to Firth	30 feet
111.9 to 112.3	Firth to Washington Street	65 feet
112.3 to 113.3	Washington Street to Blackfoot Canal Bridge	72 feet
113.3 to 117.561	Blackfoot Canal Bridge to South City Limits of Shelley	65 feet
118.696 to 120.561	North Shelley City Limits to Bingham/Bonneville County line	80 feet

US-91 is intersected by numerous county and city streets and numerous driveway access points. Many of the cross streets intersect the highway at a skew angle. There is one grade separated interchange on US-91 in the study corridor – the I-15 South Blackfoot Interchange.

2.2 Existing Traffic Volumes



Existing traffic conditions were determined by performing afternoon (PM) peak hour turning movement counts during October, 2004 at 34 unsignalized intersections and five signalized intersections within the study corridor. Percent heavy vehicles, larger trucks which tend to use a higher share of the capacity compared to smaller vehicles, were also obtained in this count program. This information was used to determine the baseline traffic operations for the US-91 corridor.

US-91 currently carries approximately 4,400 vehicles per average day ("average annual daily traffic" or AADT) on the south end of the corridor to almost 14,300 AADT between York Road and Sunnyside Road². Volumes are generally higher in the middle and on the north end of the corridor compared to the south end of the corridor.

Peak hour volumes comprise 10 to 15% of the daily traffic. Peak hour volumes are highest in the New Sweden to York segment and in the South Blackfoot I-15 Interchange to Airport segment where PM peak hour volumes are approximately 780 vehicles per hour. Volumes are lowest on the southern segment near Ballard Road where PM peak hour volumes are between 320 and 340 vehicles per hour.

Heavy-truck percentages fluctuate within the corridor. The highest percentages, 6-10 and 10-15% are found in the two segments between Sheepskin and Airport Roads. The Siphon Road to Sheepskin Road and the New Sweden Road to York Road sections have the lowest heavy truck percentages, ranging between 2 to 3% of total traffic.

Volumes fluctuate by season of the year. According to the US-91 automated traffic recorder in North Pocatello, summer volumes tend to be the highest and winter volumes tend to be the lowest. Summer volumes tend to be about 10% higher than winter volumes.

ITD uses the "30th highest hour" (30HV) volumes for planning, analysis, and design purposes. The 30HV is the hour of the year which ranks 30th out of all the hours of

² AADT traffic volumes were obtained from ITD's Highway Data Quest located at <http://www3.state.id.us/egi-bin/webster.cgi>

the year. Planning for the highest hours tends to lead toward "over design"; using the 30HV tends to balance mobility with practicality of design, funding, and environmental impacts. The 30HV tends to occur in September of each year.

Table 2-3 summarizes current daily and peak hour for the five analysis segments. The graphic to the left illustrates the comparative traffic flows along the US-91 corridor.

Table 2-3. Current Daily and Peak Hour Volumes

Segment	Average Weekday PM Peak Hour	AADT	Percent Heavy Trucks
Siphon Road to Sheepskin Road	410-450	4,400	2-3%
Sheepskin Road to I-15 S. Blackfoot Interchange	330-360	3,200	10-15%
I-15 S. Blackfoot Interchange to Airport Road	630-690	7,400	6-10%
Airport Road to New Sweden Road	480-530	4,100	3-6%
New Sweden to York Road	690-760	7,000	2-3%
York Road to Sunnyside Road	1,360-1,500	14,300	2-3%

2.3 Existing Traffic Control

Side streets and driveways are generally stop-sign controlled along the US-91 corridor. There are five signalized intersections along the US-91 corridor, all located within the urban portions of the corridor. The intersection and jurisdiction are shown in Table 2-4.

Table 2-4: US-91 Signalized Intersections

Intersection With US-91	City/County
Judicial Street	Blackfoot/Bingham
Bridge Street	Blackfoot/Bingham
Alice Street	Blackfoot/Bingham
Fir Street	Shelley/Bingham
York Road	Bonneville County

2.4 Current and Planned Roadway Improvements

The State of Idaho develops a Statewide Transportation Improvement Program (STIP) that establishes an implementation plan for transportation projects throughout the State. The draft Fiscal Year 2007 to 2011 STIP³ contains a number of projects for US-91 within the corridor plan study area between Siphon Road and Sunnyside Road. Table 2-5 summarizes these scheduled improvements.

Table 2-5: Scheduled US-91 STIP Projects

Key #	Project Name	Type of Project	Fiscal Year
7683	Wooton Way to East Airport Road, Blackfoot	Major widening	2008
8265	Agency Road Partnership, Bingham County	Safety improvement	2008
9233	Intersection Reservation Road	Intersection safety improvement	2008
9366	Ferry Butte Road to South Blackfoot Interchange	Pavement rehabilitation	2007
9371	Agency Road to Ferry Butte Road	Seal coat	2008

³ The Draft 2007 to 2011 STIP was published in December 2006 and is awaiting federal approval.

2.5 Existing Level-of-Service

Capacity analyses were performed for the five US-91 roadway segments and for 39 intersections using the PM peak hour turning movement counts. Capacity analysis is the procedure used to compare the carrying capacity of a roadway with existing or forecasted traffic volumes. The volume to capacity ratio is a measure of roadway congestion, calculated by dividing the number of vehicles passing through a section of highway during the peak hour by the capacity of the section.

The ability of a roadway system to accommodate traffic demand is governed in part by the capacity of individual intersections. The key congestion points are generally located at the intersections. Thus, both roadway segment and intersection capacity analysis are principal tools used in traffic engineering to determine the adequacy of a system to meet traffic demands. Level-of-service (LOS) is a term used to describe the degree of traffic congestion.

In general, roadway segment levels of service are defined as follows:⁴

- Level-of-Service A- represents free flow.
- Level-of-Service B- is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable.
- Level-of-Service C- is in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream.
- Level-of-Service D- represents high-density but stable flow. Speed and freedom to maneuver are severely restricted, and the driver or pedestrian experiences a generally poor level of comfort and convenience.
- Level-of-Service E- represents operating conditions at or above the capacity level. All speeds are reduced to a low but relatively uniform value.
- Level-of-Service F- is used to define forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount that can traverse the point.

The following sections document the traffic count data and apply those numbers to the existing capacity of the roadway segments, signalized intersections, and unsignalized intersections to develop LOS ratings.

Existing volumes were input into the Highway Capacity software (HCM: McTrans, 2003) to estimate current levels-of-service. For the US-91 mainline, traffic flows are relatively unconstricted except by traffic signals, locations where vehicles turning off of US-91 do not have their own lane, and where overtaking of slower-moving vehicles is impeded due to a no-passing zone or by oncoming traffic.

The two-lane highway HCM method bases LOS on the amount of time a vehicle is constrained to follow another slower-moving vehicle due to the presence of no-passing zones or oncoming traffic. The higher the percentage of time spent following another vehicle, the lower the average speed and the lower the LOS.

⁴ Transportation Research Board, HCM 2000, page 10-5.

2.5.1 Corridor Roadway Segments

A capacity analysis for the corridor segments was conducted in accordance with the methodology contained in Chapter 20 of the Highway Capacity Manual (HCM). The analysis assumed eight access points per mile, a base free flow speed of 55 at the south end of the corridor and 55 mph on the north end, and a 50% no-passing zone along the corridor. The LOS is determined by both the percent of time spent following another vehicle and the average travel speed as shown in Table 2-6.

Table 2-6: Two-Lane Highway Level of Service Criteria

LOS	Percent Time Following	Average Travel Speed
A	≤35	>55
B	>35 and ≤50	>50 and ≤55
C	>50 and ≤65	>45 and ≤50
D	>65 and ≤80	>40 and ≤45
E	>80	≤40

Note: LOS F applies whenever the flow rate exceeds the capacity

Roadway capacity was measured by the volume-to-capacity (v/c) ratio, which is the ratio between the volume on a segment and the roadway capacity of that segment. A v/c ratio greater than 1.0 represents failure conditions, whereas a v/c ratio less than 0.7 to 0.8 is generally considered acceptable and a ratio less than 0.5 is excellent.

Table 2-7 summarizes existing US-91 mainline LOS. It was calculated using HCM techniques, the percent of time spent following other vehicles in the traffic stream (inability to pass), the average speed (based on the posted speed limit of 55 mph in the rural sections of US-91), and the peak hour volume-to-capacity ratio.

Table 2-7: 2004 Roadway Segment Level of Service

Segment	Roadway		2004 Existing Conditions				ITD LOS Standard	Deficient?
			LOS	% Time Following	Average Speed	v/c Ratio		
1	Siphon Road	Sheepskin Road	B	48.00%	51.1	0.16	C	No
2	Sheepskin Road	I-15 S. Blackfoot Interchange (Bannock Road)	A	32.40%	55.2	0.13	C	No
3	I-15 S. Blackfoot I.C. (Bannock Road)	Airport Road	C	61.60%	50.3	0.23	C	No
4	Airport Road	New Sweden Road	B	43.40%	53	0.19	C	No
5	New Sweden Road	York Road	C	56.00%	51	0.25	C	No
6	York Road	Sunnyside Road	A	-	58.4	-	C	No

2.5.2 Signalized and Unsignalized Intersections

For intersections, the unsignalized and signalized HCM methodologies were used to estimate LOS. Capacity analyses for signalized intersections were performed using Highway Capacity Software (HCS), which utilizes the methodologies established by Chapter 16 of the (HCM). Data parameters that are input into the analyses include the number of lanes, land use, traffic volumes by turning movement, and signal cycle length. The primary output of the software is LOS which is based on total intersection delay. Total intersection delay is defined as the amount of time it takes each vehicle to travel through the intersection. For unsignalized intersections, capacity analysis was performed using the methodology in Chapter 17 of HCM 2000.

Table 2-8 lists the intersection Levels of Service and their associated range of delay.

Table 2-8. Intersection Level of Service Criteria⁵

LOS	Signalized	Stop-Controlled	Description
	Delay (sec/veh)	Delay (sec/veh)	
A	≤10	≤10	Free-Flowing
B	>10 and ≤20	>10 and ≤15	Minimal Delays
C	>20 and ≤35	>15 and ≤25	Acceptable Delays
D	>35 and ≤55	>25 and ≤35	Tolerable Delays
E	>55 and ≤80	>35 and ≤50	Significant Delays
F	>80	>50	Excessive Delays

Table 2-9 summarizes existing US-91 intersection LOS and the intersection delay in terms of average delay per vehicle. HCM techniques were used to analyze the intersections.

2.5.3 Summary of Level-of-Service Conditions

Existing LOS for the US-91 corridor is summarized in Figures 2 through 7. All but three rural intersections operate at LOS B, the ITD standard for rural roadways. The intersections with Country Club Road and Canyon Road operate at LOS C, below the rural standard. All urban intersections operate at or greater than LOS C, the ITD standard for urban roadways.

US-91 mainline segments analyzed generally meet ITD's LOS C standard under existing conditions.

⁵ Transportation Research Board, HCM 2000, pages 16-2 and 17-2.

Table 2-9: Existing 2004 Intersection Levels of Service

#	Intersection	Context	LOS	Delay ⁺	ITD LOS Standard	Substandard
1	Siphon	Urban	C	16.0	C	No
2	Tyhee	Urban	C	15.6	C	No
3	Reservation	Rural	B	14.3	B	No
4	Ballard	Rural	B	11.2	B	No
5	Cemetery	Rural	B	13.4	B	No
6	Indian School	Rural	B	11.8	B	No
7	Agency	Urban	C	15.5	C	No
8	Ferry Butte	Rural	B	11.9	C	No
9	Bannock	Rural	A	9.9	C	No
10	Riverton	Rural	A	9.9	C	No
11	I-15 IC #89 NB	Rural	C	16.2	C	No
12	I-15 IC #89 SB	Rural	A	9.9	C	No
13	Shilling	Urban	B	13.3	C	No
14	Walker	Urban	C	19.4	C	No
15	Riverton (Blackfoot)	Urban	B	12.4	C	No
16a	Grant	Urban	B	12.2	C	No
16b	Broadway	Urban	A	9.9	C	No
17	Judicial*	Urban	B	15.0	C	No
18	Bridge*	Urban	A	5.3	C	No
19	Alice*	Urban	A	6.7	C	No
20	Highland-Rich	Urban	C	22.6	C	No
21	Wooton	Urban	B	13.2	C	No
22	Airport	Urban	C	18.8	C	No
23	Mark	Urban	B	12.6	C	No
24a	Merkley-Tanner	Urban	B	12.5	C	No
24b	Hansen	Urban	A	9.7	C	No
25a	Weeding	Rural	A	9.5	C	No
25b	Cottonwood	Rural	B	11.5	C	No
26a	Wapello (West Leg)	Rural	B	11.0	C	No
26b	Wapello (East Leg)	Rural	B	11.1	C	No
27	Wapello-Firth	Rural	B	11.7	C	No
28	Wolverine	Rural	B	10.9	C	No
29	Firth	Urban	B	10.9	D	No
30	Goshen	Urban	B	12.5	D	No
31	Sand Creek	Rural	A	9.4	B	No
32	Baseline	Urban	B	14.0	D	No
33	Fir*	Urban	A	6.0	D	No
34	Locust	Urban	C	20.2	D	No
35	Center-Taylor	Urban	C	20.2	D	No
36	New Sweden	Urban	B	10.9	D	No
37	Country Club	Rural	C	18.1	C	No
38	Canyon	Rural	C	15.6	C	No
39	York*	Rural	A	8.6	C	No

⁺Delay at unsignalized intersection is for the approach with the higher delay.

*Signalized Intersection.

2.6 Existing Intersection Traffic Operations

Existing intersection traffic operations were examined for the corridor. This analysis included a review of LOS, intersection safety including crash history, and existing numbers of left-turning and right-turning vehicles. ITD's turning lane "warrants" were used to identify locations where existing volumes warrant a right-turn or left-turn lane.

Left turn lane warrants are based on Section 452.01 of the ITD Traffic Manual. Warrants are based on hourly turning and through traffic movements (in the highest volume direction) on US-91, as well as the posted speed. The ITD Traffic Manual states "in most cases, left-turn lanes should be provided where there are more than 12 left turns per peak hour". Table 9 summarizes existing left-turn lane needs and deficiencies.

Right-turn lane warrants are found in Section 452.02 of the Traffic Manual. They are based on peak hour right-turning volumes, hourly volume of the highway, and posted speed. The Traffic Manual also states "where the existing shoulder is of adequate width, it may be possible to adjust the pavement markings to provide a sufficient right-turn lane without widening the road". Table 10 summarizes existing right-turn lane needs and deficiencies.

Turn lanes that are warranted are shown in bold in Tables 2-10 and 2-11 and illustrated graphically on Figures 2 through 6.

On Table 2-11, yellow highlighted boxes indicate where sufficient pavement appears to be available for a right-turn lane; however, one is not currently striped. This observation is based on examination of aerial photography.

Table 2-10: Existing Intersection Left-Turn Lane Summary

#	Intersection	Northbound US-91			Southbound US-91		
		Existing LT Vol.	Volume Threshold	Turn Lane Warranted?	Existing LT Vol.	Volume Threshold	Turn Lane Warranted?
1	Siphon	31	12	Yes	4	12	No
2	Tyhee	37	12	Existing	10	12	No
3	Reservation	55	12	Yes	4	12	No
4	Ballard	14	12	Yes	7	12	No
5	Cemetery	15	12	Yes	1	12	No
6	Indian School	n/a	n/a	n/a	7	12	No
7	Agency	14	12	Yes	72	12	Yes
8	Ferry Butte	40	12	Yes	1	12	No
9	Bannock	n/a	n/a	n/a	10	12	No
10	Riverton	6	15	No	n/a	n/a	n/a
11	I-15 IC #89 NB	23	12	Existing	n/a	n/a	n/a
12	I-15 IC #89 SB	11	12	Existing	n/a	n/a	n/a
13	Shilling	n/a	n/a	n/a	35	12	Yes
14	Walker	24	12	Existing	194	12	Existing
15	Riverton (Blackfoot)	123	12	Existing	n/a	n/a	n/a
16a	Grant	18	12	Existing	n/a	n/a	n/a
16b	Broadway	72	12	Yes	n/a	n/a	n/a
17	Judicial*	n/a	n/a	n/a	163	12	Existing
18	Bridge*	31	12	Existing	n/a	n/a	n/a
19	Alice*	8	12	Existing	59	12	Existing
20	Highland-Rich	60	12	Yes	35	12	Existing
21	Wooton	22	12	Existing	n/a	n/a	n/a
22	Airport	149	12	Existing	n/a	n/a	n/a
23	Mark	8	12	No	n/a	n/a	n/a
24a	Merkley-Tanner	n/a	n/a	n/a	14	12	Yes
24b	Hansen	33	12	Yes	n/a	n/a	n/a
25a	Weeding	9	12	No	n/a	n/a	n/a
25b	Cottonwood	n/a	n/a	n/a	2	12	No
26a	Wapello	4	12	No	n/a	n/a	n/a
26b	Wapello	n/a	n/a	n/a	14	12	Yes
27	Wapello-Firth	2	12	No	3	12	No
28	Wolverine	n/a	n/a	n/a	3	12	No
29	Firth	27	12	Yes	14	12	Existing
30	Goshen (just reconstructed)	4	12	No	14	12	Yes
31	Sand Creek	n/a	n/a	n/a	42	12	Yes
32	Baseline	8	12	No	78	12	Yes
33	Fir*	19	12	Existing	29	12	Existing
34	Locust	2	12	No	64	12	Yes
35	Center-Taylor	3	12	Existing	84	12	Existing
36	New Sweden	69	12	Existing	n/a	n/a	n/a
37	Country Club	19	12	Existing	9	12	Existing
38	Canyon	3	12	No	2	12	No
39	York*	15	12	Existing	15	12	Existing

* Signalized intersection.

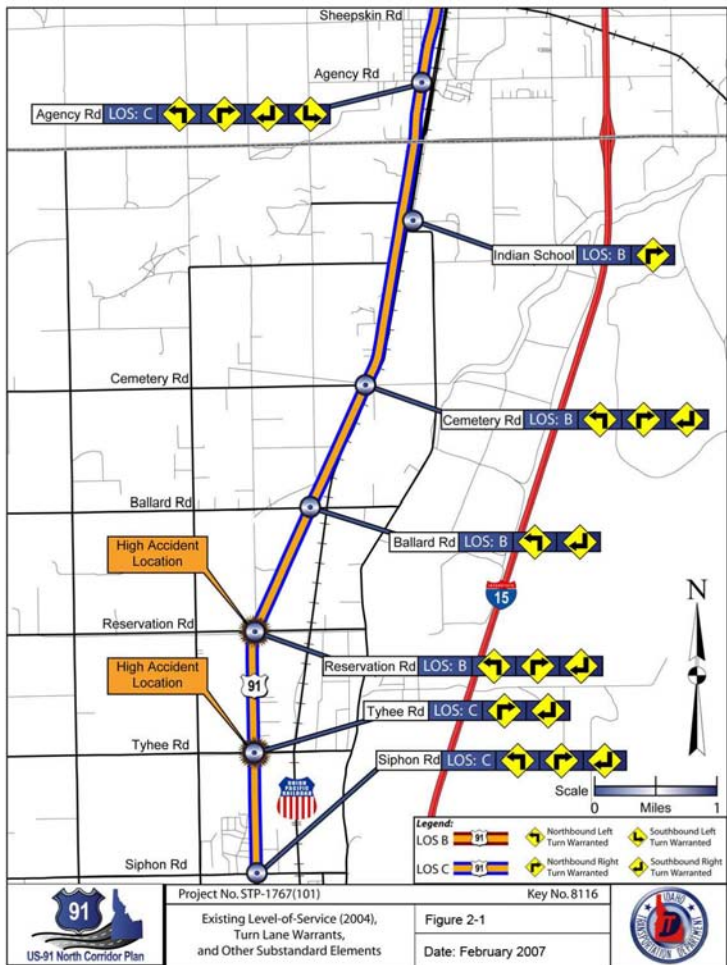
** Not Applicable. T-intersection or turning movement not allowed.

Table 2-11. Existing Intersection Right-Turn Lane Summary

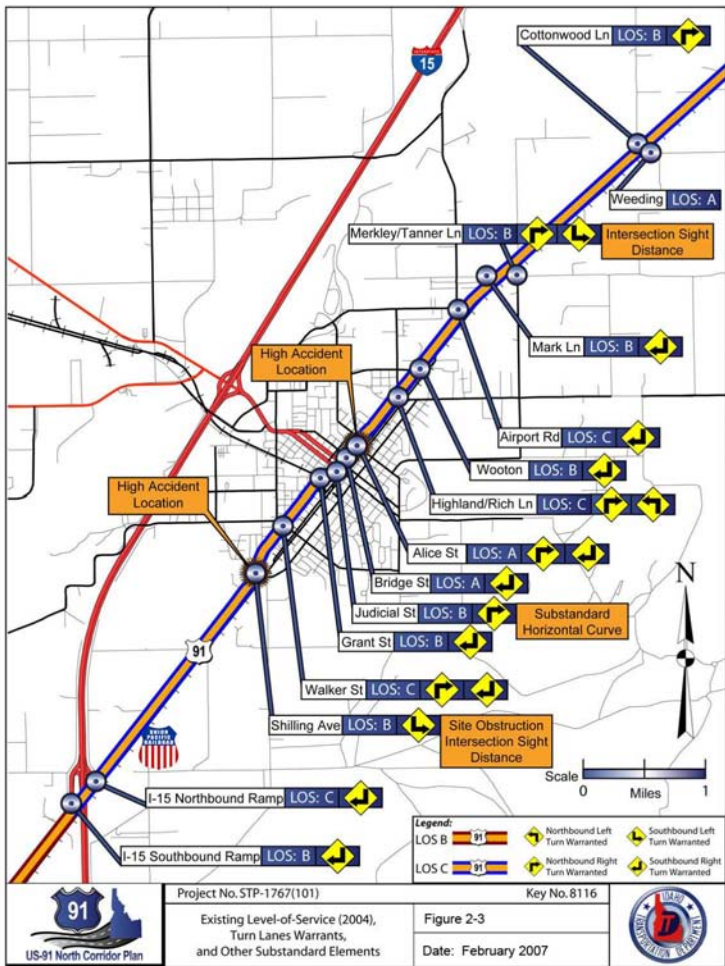
#	Intersection	Northbound US-91			Southbound US-91		
		Existing RT Vol.	Volume Threshold	Turn Lane Warranted?	Existing RT Vol.	Volume Threshold	Turn Lane Warranted?
1	Siphon	41	5	Yes	32	5	Yes
2	Tyhee	56	5	Yes	23	5	Yes
3	Reservation	16	5	Yes	14	5	Yes
4	Ballard	2	5	No	13	5	Yes
5	Cemetery	7	5	Yes	18	5	Yes
6	Indian School	46	5	Yes	n/a**	n/a	n/a
7	Agency	27	6	Yes	12	5	Yes
8	Ferry Butte	1	5	No	30	6	Yes
9	Bannock	2	5	No	n/a	n/a	n/a
10	Riverton	n/a	n/a	n/a	30	10	Yes
11	I-15 IC #89 NB	n/a	n/a	n/a	9	5	Yes
12	I-15 IC #89 SB	n/a	n/a	n/a	116	5	Yes
13	Shilling	59	5	Existing	n/a	n/a	n/a
14	Walker	26	7	Yes	12	5	Yes
15	Riverton (Blackfoot)	n/a	n/a	n/a	42	5	Yes
16a	Grant	n/a	n/a	n/a	28	5	Yes
16b	Broadway	n/a	n/a	n/a	7	6	Yes
17	Judicial*	104	5	Yes	n/a	n/a	n/a
18	Bridge*	n/a	n/a	n/a	182	5	Yes
19	Alice*	107	5	Yes	15	5	Yes
20	Highland-Rich	98	5	Yes	2	5	No
21	Wooton	n/a	n/a	n/a	16	8	Yes
22	Airport	n/a	n/a	n/a	57	5	Yes
23	Mark	n/a	n/a	n/a	24	5	Yes
24a	Merkley-Tanner	62	5	Yes	n/a	n/a	n/a
24b	Hansen	n/a	n/a	n/a	2	9	No
25a	Weeding	n/a	n/a	n/a	1	5	No
25b	Cottonwood	31	5	Yes	n/a	n/a	n/a
26a	Wapello	n/a	n/a	n/a	0	5	No
26b	Wapello	26	5	Yes	n/a	n/a	n/a
27	Wapello-Firth	8	5	Yes	5	5	No
28	Wolverine	15	6	Yes	n/a	n/a	n/a
29	Firth	1	5	No	3	5	No
30	Goshen (just reconstructed)	50	5	Yes	13	5	Yes
31	Sand Creek	7	8	Yes	n/a	n/a	n/a
32	Baseline	14	6	Yes	7	5	Yes
33	Fir*	22	8	Yes	193	5	Yes
34	Locust	22	6	Yes	28	5	Yes
35	Center-Taylor	39	5	Yes	16	5	Yes
36	New Sweden	n/a	n/a	n/a	25	5	Yes
37	Country Club	26	5	Yes	13	5	Yes
38	Canyon	8	5	Yes	10	5	Yes
39	York*	28	7	Existing	0	5	No

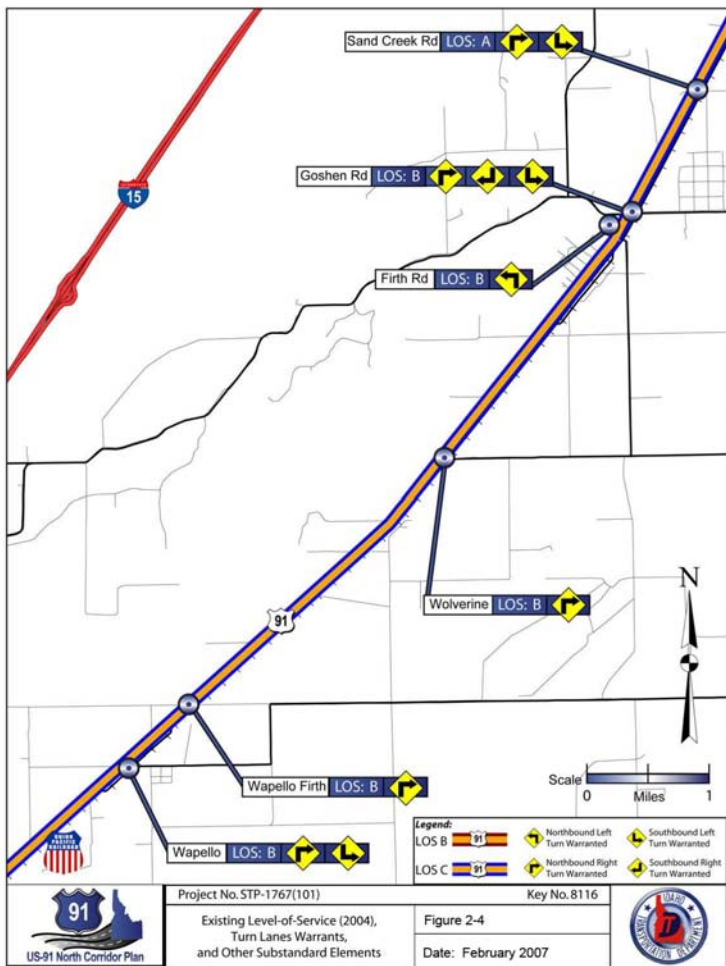
* Signalized intersection.

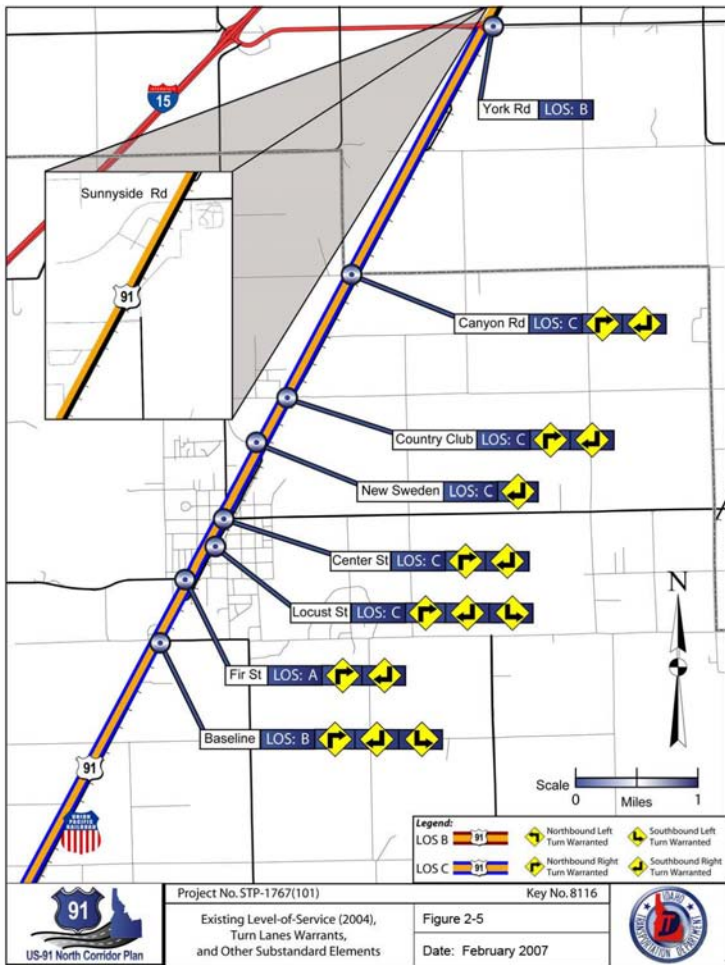
** Not applicable. T-intersection or movement not allowed.











2.7 Existing Traffic Safety

This section addresses the crash history and characteristics of the US-91 North Corridor. The collision history is based on records provided by the Office of Highway Safety for the period of January 1, 2001 to December 31, 2005. The crash analysis is used to identify existing and potential safety problems with US-91.

2.7.1 Crash Rates

There were 652 crashes within the study corridor over the five-year period ranging from a low of 107 in 2001 to a high of 150 in 2005. Table 2-12 summarizes the seven intersections that have had 10 or more crashes over the last five years and identifies in which segment they are located. They are listed in order of highest to lowest number of crashes.

Table 2-12: Intersection Crashes

US-91 Intersection	Segment	Crashes
Bridge Street	Bannock Road to Airport Road	32
York Road	New Sweden Road to York Road	15
Tyhee Road	Siphon Road to Sheepskin Road	14
Alice Street	Bannock Road to Airport Road	13
Reservation Road	Siphon Road to Sheepskin Road	12
Pedersen St	York Road to Sunnyside Road	11
Judicial Street	Bannock Road to Airport Road	11

2.7.2 Crash Type and Severity

Crash severity is based on the following scale provided by ITD:

- Fatal: Injury results in death within 30 days of when injury occurred.
- A-Injury: Incapacitating injury which prevents the injured person from normally continuing the activities the person was capable of performing before the injury occurred, including severe lacerations, broken or distorted limbs, and skull or chest injuries.
- B-Injury: Non-incapacitating injury which is evident to observers at the scene. Includes bumps, bruises, and minor lacerations.
- C-Injury: Possible injury that includes claim of injuries not evident, limping, complaint of pain, nausea, hysteria.
- PD/RPT: Reportable property damage in excess of \$750.

Table 2-13 summarizes the crashes by severity and type. The three highest causes are shown in bold italic type. The top 3 crash types in the corridor are:

1. Angle (31%) This type of collision usually occurs where there is unsignalized side-street access or driveways.
2. Fixed Object (21%) This type of collision involves roadway objects such as median barriers, luminaries, and guardrails. It also includes other objects such as trees, utility poles and parked cars. Reasons cited for this type of collision include failure to yield, inattention, and drivers exceeding the posted or advisory speed, or traveling too fast for conditions.

3. **Rear-End (18%)** This type of collision is usually the result of high levels of congestion and following too closely. In rural areas, this type of crash is the result of unexpected stoppages in traffic, such as that due to a wildlife crossing or a vehicle turning onto the highway where sight distance is obstructed.

The top three types of crashes account for 70% of crashes occurring on US-91. Ten fatal collisions occurred and account for 2% of all crashes that occurred in the five-year time period.

Table 2-13: Crash Type and Severity

Crash Type	Fatal	A-Injury	B-Injury	C-Injury	PD/Rpt	Total	Percent (Type)
Angle	6	17	29	32	111	195	31%
Animal	0	0	0	3	29	32	5%
Fixed Object	1	8	12	23	86	130	21%
Head-On	2	8	7	11	19	47	8%
<i>Overturn</i>	<i>0</i>	<i>1</i>	<i>6</i>	<i>7</i>	<i>17</i>	<i>31</i>	<i>5%</i>
Rear-End	1	7	12	30	60	110	18%
Same Direction Turning	0	2	5	5	16	28	4%
Sideswipe	0	0	3	6	43	52	8%
Other	3	3	4	4	13	27	4%
Total	10	43	74	117	381	625	100%
Percent (severity)	2%	7%	12%	19%	61%	-	-

2.7.3 Crash Rates

Table 2-14 summarizes the total crashes and resultant crash rates by study segment along the corridor. The statewide average crash rate for the non-interstate state highway system is 182.86 crashes per 100 Million Vehicle Miles of Travel (VMT) as stated in Table 10 of the *Idaho Traffic Collisions 2003* report. The statewide average fatal crash rate is 2.3.

The US-91 study corridor is experiencing a crash rate of 155.56 crashes per 100 million vehicle miles of travel and a fatal crash rate of 3.3 fatal crashes per 100 million VMT. The corridor is below statewide average in terms of overall crashes but is above the statewide average in fatal crash rate.

Table 2-14: Segment Crash Rates

Segment	Roadway		Length in Miles	Total Crashes	Fatal Crashes	AADT*	Crash Rate	Fatal Crash Rate
	From	To						
1	Siphon Road	Sheepskin Road	7.30	104	4	4,304	181.5	7.0
2	Sheepskin Road	Bannock Road	7.52	33	1	3,255	73.9	2.2
3	I-15 South Blackfoot Interchange (Bannock Road)	Airport Road	6.02	181	0	6,641	248.0	0.0
4	Airport Road	New Sweden Road	16.51	193	3	4,084	156.8	2.4
5	New Sweden Road	York Road	3.93	60	4	6,964	120.0	8.0
6	York Road	Sunnyside Rd	2.17	81	1	13,660	150.0	1.9
Statewide Average (Non-Interstate)				42,894	537	-	182.86	2.3

*Average Annual Daily Traffic (AADT) is the average of 2001-2005

Two study segments have crash rates that are near or above the statewide average:

- Segment 1 - Siphon Road to Sheepskin Road
- Segment 3 – I-15 South Blackfoot Interchange (Bannock Road) to Airport Road.

These two segments are analyzed below and in detail in Sections 2.7.5 and 2.7.6 of this document.

Segments 1 and 3

The two segments with the highest crash rates (181.5 and 248.0) are generally within the more urbanized areas of the corridor. The I-15 South Blackfoot Interchange to Airport Road includes the section of US-91 that passes through the City of Blackfoot. The higher rates may be higher due to higher travel speeds, drivers exceeding the speed limit and inattentive drivers which are more common in rural areas. As drivers approach urban intersections and traffic signals, they might not adjust their driving behavior for the urban conditions.

The predominant crash type was “Angle” in both of the study segments where the crash rate exceeded the statewide average. Of the four fatal crashes in Segment 1, two involved pedestrians. There were no fatalities in segment 3.

Segment 2 – Sheepskin Road to Bannock Road

This section had a total of 33 crashes including 1 fatality. The crash rate is 73.9 crashes for every 100 million vehicle miles. The fatality rate is 2.2 for every 100 million vehicle miles. This section had the highest percentage of crashes that involved alcohol or drugs. Four out of the 33 crashes or 12% of all the crashes in this section involved an impaired driver. There were no locations that showed any crash trends in this segment. There was one fatality on this section. It involved a vehicle and a pedestrian.

Segment 4 – Airport Road to New Sweden

This section had a total of 193 crashes including 3 fatalities. The crash rate is 156.8 crashes for every 100 million vehicle miles. The fatality rate is 2.4 for every 100 million vehicle miles.

This section experienced a high number of vehicle/animal conflict crashes. Almost 80% of all animal crashes occurred in this segment. There were 25 crashes which involved animal/vehicle conflicts, 16 of them with wild animals. All of these crashes with wild animals occurred between Wapello Road and Monroe Street (mile post 106.559 – 115.032) with almost half occurring between Division Street and the Blackfoot Canal (mile post 112.487 – 113.251).

There were 3 fatal accidents in this section. One accident occurred at the intersection of US-91 and Wicks Road and involved an angle accident. The other fatalities involved a rear end and a head on collision.

Segment 5 – New Sweden to York Road

This section had a total of 60 crashes including 4 fatalities. The crash rate is 120.0 crashes for every 100 million vehicle miles. The fatality rate was the highest of all the segments at 8.0 fatalities for every 100 million vehicle miles. The intersection of US-91 and York Road had a total of 15 accidents. One third of these crashed involved an “angle” event or an “angle turning” event. Three of the 4 fatalities were the result of an angle crash. Two of these 3 crashes occurred at the intersection of US-91 and Country Club Road and one at the intersection of York Road. The other was a result of a head on crash

Segment 6 – York Road to Sunnyside Road

This section had a total of 89 crashes including 2 fatalities. The crash rate is 150.0 crashes for every 100 million vehicle miles. The fatality rate is 1.9 for every 100 million vehicle miles. There were a total of 11 crashes at or related to the intersection of Pedersen and US-91. Eight of these 11 crashes involved a driver turning left. Nine of these crashes involved a vehicle traveling south on US-91. Twenty-two of the 89

crashes involved a rear end accident. Twenty-five accidents involved an “angle” event or an “angle turning” event.

There was one fatality on this section which involved a vehicle which was traveling too fast for the conditions.

2.7.4 High Accident Locations

ITD uses crash history data to compile a statewide list of the top 20 High Accident Locations (HALs) for both roadway segments and intersections. The objectives of the HAL program are to:

- Identify locations on the State Highway System with potential safety deficiencies;
- Systematically compare problem locations on a statewide basis; and
- Minimize the probability of identifying artificial problem areas.

The HAL program utilizes two separate methodologies: one to identify problem interchanges and intersections, and one to identify problem roadway segments. The program uses collisions in a clustering process to identify roadway segments that are prone to collisions that do not occur at intersections.

The HAL program employs the same ranking criteria, with minor variations, for systematically ranking HALs on a statewide basis for both intersections and roadway segments. The position of a location in the HAL listing is determined by its statewide ranking in the following three categories:

- *Collision frequency* – Locations with a greater number of collisions rank higher than those locations with fewer collisions. To avoid bias toward urban locations with higher volumes, the HAL program combines collision frequency with severity and collision rate.
- *Severity* – Locations characterized by crashes of greater injury severity and economic costs to society are ranked higher. Severity is analyzed and ranked by three separate categories: (1) most harmful event, (2) collisions broken down into speed ranges, and (3) Federal Highway Administration (FHWA) injury cost estimates. Most harmful events and speeds are analyzed because certain types of crashes and higher speeds tend to influence crash severity and help to predict future severity ranges at locations. The FHWA cost is an economic evaluator based on cost data reflecting what people would be willing to pay to avoid types of injury crashes.
- *Collision rate* – Locations that tend to experience more collisions than expected based on the amount of vehicle travel are ranked higher. Crash rates are a tool used to account for the influence of vehicular volumes on crashes. Thus, crash comparisons that account for traffic volumes are less likely to be influenced by changing volumes and more likely focused on other roadway elements that may be influencing crash statistics.

The Idaho Office of Highway Safety's HAL report presents the top 20 crash segments within ITD District 5 when compared to other facilities within the state of Idaho. The statewide rankings are based on three years of collision data (2001-2003) as well as collision frequency, severity, and collision rate. Only one of the District's top 20 crash segments is within the US-91 project study area. The HAL segment is located between Tyhee Road and West Reservation Road. This segment is only 0.29 miles long and ranks last on the District 5 top 20 crash segments.

ITD's HAL report presents the top 20 crash intersections within District 5 when compared to other facilities within the State of Idaho. One of the District's top 20 HAL intersection locations is within the US-91 project study area. The statewide rankings for intersections are also based on three years of collision data (2001-2003) as well as collision frequency, severity (economic loss), and collision rate. Reservation Road is

ranked number 3 in District 5's top crash intersection list. Intersection improvements are being developed and are included in the State Transportation Implementation Plan as Key No. 9233, scheduled for 2008.

Three study segments currently have crash rates that are above the statewide average: Siphon Road to Sheepskin Road, Airport Road to New Sweden Road and New Sweden Road to York Road.

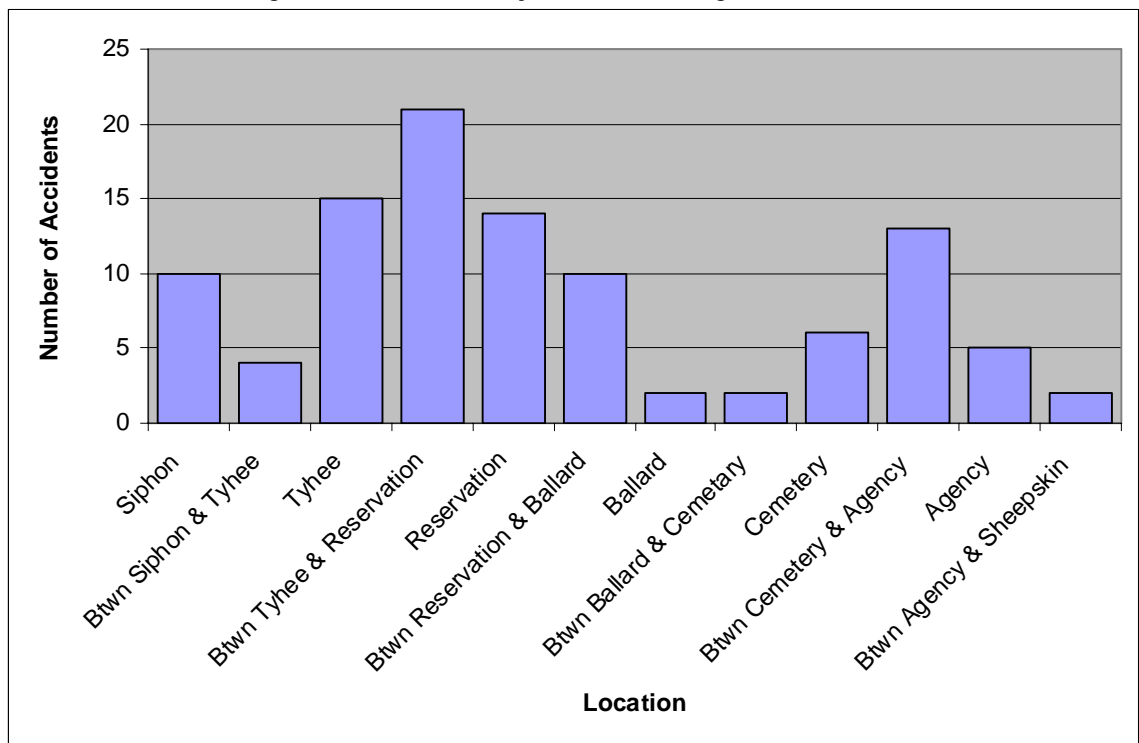
2.7.5 Siphon Road to Sheepskin Road Detailed Crash Analysis

A detailed analysis of accidents for this segment was conducted to better define why this segment is a High Accident Location and has crash and fatal crash rates above the statewide average.

Accidents by Location

Figure 2-6 summarizes the number of crashes along Segment 1, organized according to location. All of the accidents that occurred within 500 feet of a listed intersection are considered to be related to that intersection. Those accidents that happened further than 500 feet from listed intersections are labeled as 'between intersections'.

Figure 2-6: Accidents by Location for Segment 1



The highest number of accidents in the Siphon Road to Sheepskin Road segment is located from the Tyhee Road to Reservation Road intersections. The collisions in this area account for 47% of the total number of crashes in this segment. The contributing factors most commonly listed for these accidents include: failure to yield and driving too fast for the conditions.

Crash Type by Severity

Table 2-15 summarizes the crash types with their corresponding severity. The three highest crash types are shown in bold. Each of the listed crash types represent all of the accidents that most relate to the respective event. The 'other' category includes all of the miscellaneous accidents that did not fall into a usual type of event. Examples of these types of accidents include loss of cargo, or a pedestrian or trailers that were separated from their vehicles.

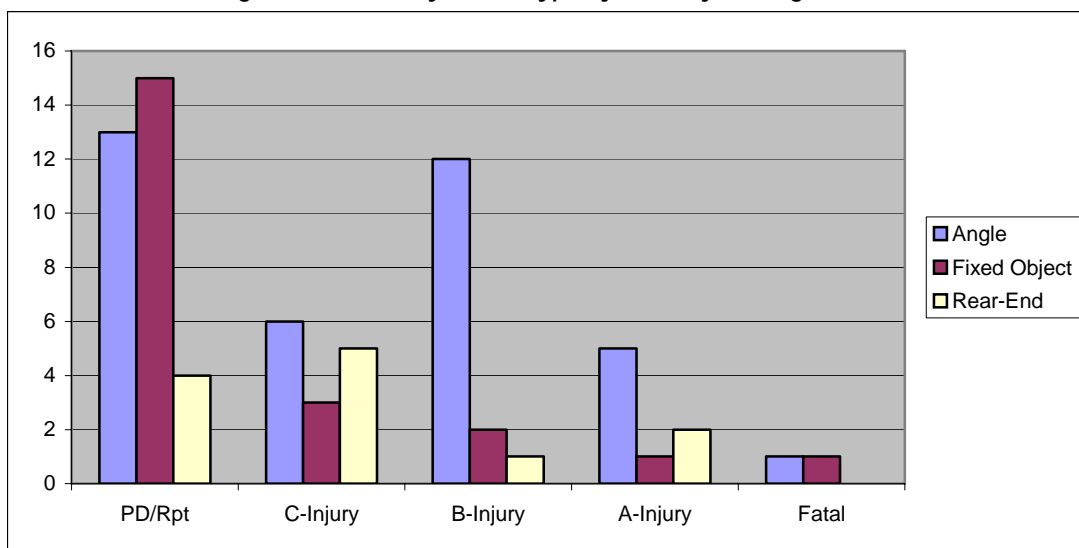
Table 2-15: Crash Types by Severity for Segment 1

Event	PD / RPT	A-Injury	B-Injury	C-Injury	Fatal	Total	%
Angle	1	5	12	6	13	37	36%
Animal	0	0	0	0	4	4	4%
Fixed Object	1	1	2	3	15	22	21%
Head-On	0	1	1	5	1	8	8%
Overturn	0	0	3	1	2	6	6%
Rear-End	0	2	1	5	4	12	12%
Same Direction Turning	0	0	0	0	2	2	2%
Sideswipe	0	0	0	1	5	6	6%
Other	2	0	0	1	4	7	7%
Total	4	9	19	22	50	104	100%

The primary contributing circumstances cited for the angle related crash types include failure to yield and inattention. The primary causes of vehicles hitting a fixed object include driving too fast for the conditions and inattention. The rear-ending related collisions were mainly caused through distractions, driving too fast for the conditions, inattention and following too close.

Figure 2-7 below shows the top three most frequent crash types, plotted according to their corresponding severity. Accidents related to fixed objects most frequently involve possible injuries such as bumps and bruises as opposed to more serious levels of severity. Where as rear-end and angle-related accidents tend to be more severe.

Figure 2-7: Primary Crash Type by Severity for Segment 1



Crash Types by Location

Table 2-16 summarizes the crash types by location along segment 1. The unnamed columns represent the accidents that occurred between the listed intersections. The crash types used in this table are the same as those used to illustrate severity in Table 2-15. The numbers in bold represent high concentrations of certain types of accidents centralized in specific locations.

Table 2-16: Crash Types by Location for Segment 1

Event		Siphon		Tyhee		Reservation		Ballard		Cemetery		Agency		Total
Angle	0	7	0	9	1	11	0	2	0	3	2	2	0	37
Animal	0	0	0	0	2	1	1	0	0	0	0	0	0	4
Fixed Object	0	1	1	1	9	1	4	0	0	0	5	0	0	22
Head-On	0	1	1	0	3	0	1	0	0	0	0	1	1	8
Overturn	0	0	0	0	1	0	0	0	2	2	1	0	0	6
Rear-End	0	1	0	1	2	1	2	0	0	0	4	0	1	12
Same Direction Turning	0	0	0	1	0	0	1	0	0	0	0	0	0	2
Sideswipe	0	0	0	2	3	0	0	0	0	0	0	1	0	6
Other	0	0	2	1	0	0	1	0	0	1	1	1	0	7
Total	0	10	4	15	21	14	10	2	2	6	13	5	2	104

US-91 intersections at Siphon Road, Tyhee Road and Reservation Road have mainly angle related accidents. The majority of these accidents were caused by failing to yield. The majority of the nine fixed object crashes between Tyhee and Reservation Road were caused by vehicles traveling too fast.

Contributing Circumstances by Location

Table 2-17 summarizes the contributing circumstances for each accident according to location.

The accidents caused by failing to yield are centrally located around the Siphon Road, Tyhee Road and Reservation Road intersections. The number of accidents caused by driving too fast for the conditions also tends to be higher between Tyhee Road and Reservation Road.

Table 2-17: Contributing Circumstances by Location for Segment 1

Contributing Circumstance		Siphon		Tyhee		Reservation		Ballard		Cemetery		Agency		Total
Alcohol Impaired	0	0	0	1	0	0	0	0	0	1	0	0	0	2
Distraction In/On Vehicle	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Exceeded Posted Speed	0	0	0	0	0	0	0	0	0	1	1	0	1	3
Failed To Signal	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Failed To Yield	0	3	0	4	1	5	0	1	0	1	0	1	0	16
Following Too Close	0	1	0	0	0	1	0	0	0	0	2	0	0	4
Improper Overtaking	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Improper Turn	0	0	0	1	0	1	1	0	0	0	1	0	0	4
Inattention	0	2	0	1	0	1	0	0	1	0	2	0	0	7
None	0	3	3	6	8	6	7	1	0	3	2	2	1	42
Other Vehicle Defect	0	0	1	0	1	0	0	0	0	0	0	0	0	2
Physical Impairment	0	0	0	1	1	0	0	0	0	0	0	0	0	2
Sick	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Speed Too Fast For Conditions	0	0	0	0	8	0	1	0	1	0	4	1	0	15
Vision Obstruction	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Other	0	1	0	0	0	0	0	0	0	0	0	1	0	2
Total	0	10	4	15	21	14	10	2	2	6	13	5	2	104

2.7.6 I-15 Bannock Road to Airport Road

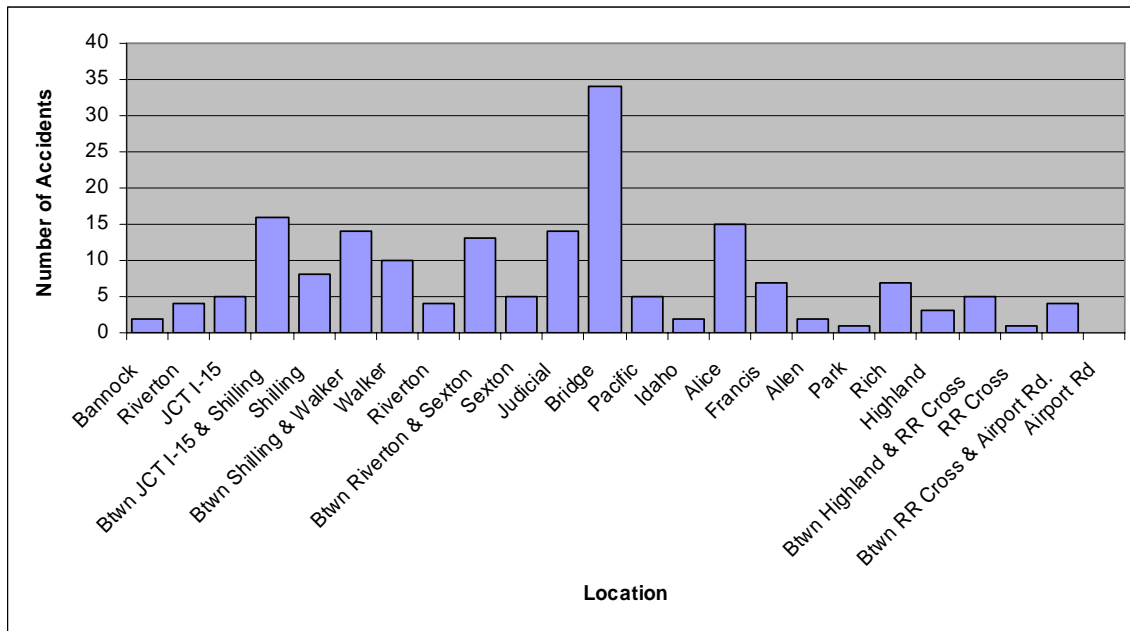
This section had the highest crash rate but had no fatalities between 2001 and 2005. The majority of this portion of US-91 is located within the urban limits of the City of Blackfoot.

Accidents by Location

Figure 2-8 summarizes the number of crashes in this segment of US-91, organized according to location. All of the accidents that occurred within 500 feet of a listed intersection are considered to be related to that respective intersection. Those accidents that happened further than 500 feet from listed intersections are labeled as 'between intersections'.

The intersection at Bridge Street accounts for nearly 20% of the total number of accidents. The contributing circumstances most commonly cited for the collisions at this intersection include: failure to yield, inattention, and passing a stop sign/disregarding a signal.

Figure 2-8: Accidents by Location for Segment 3



Crash Type by Severity

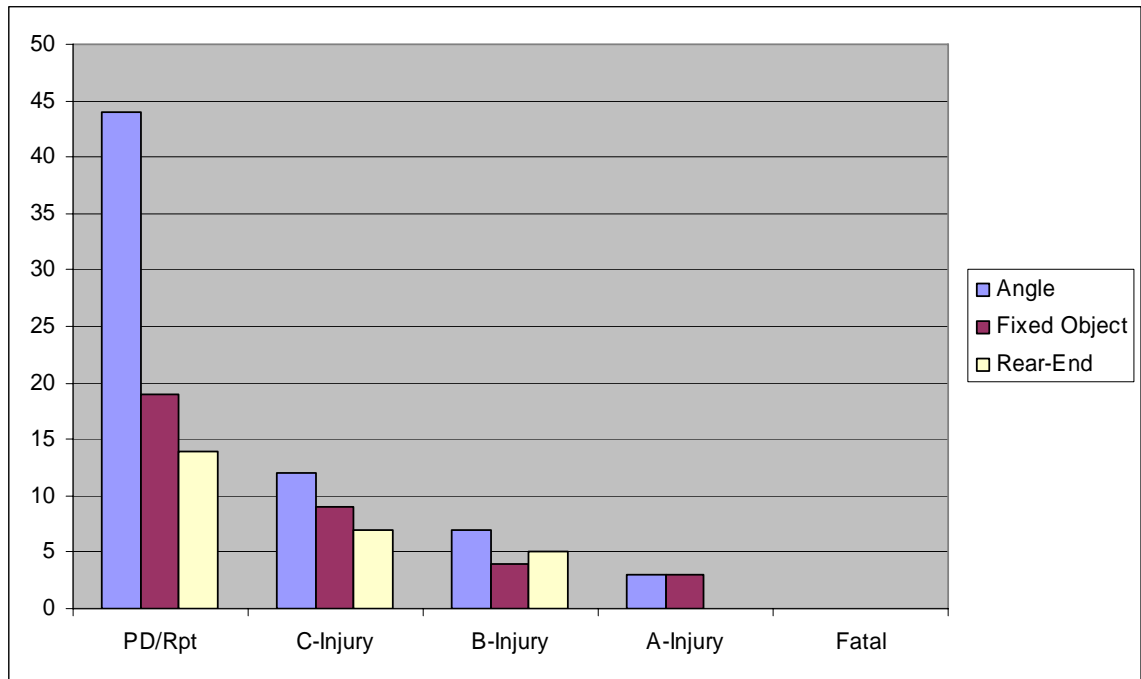
Table 2-18 summarizes the crash types with their corresponding severity. The three highest crash types are shown in bold. Each of the listed crash types represent all of the accidents that most relate to the respective event. The 'other' category includes all of the miscellaneous accidents that did not fall into a usual type of event. Examples of these types of accidents include loss of cargo, or a pedestrian or trailers that were separated from their vehicles.

Table 2-18: Crash Types by Severity for Segment 3

Crash Type	Fatal	A-Injury	B-Injury	C-Injury	PD/Rpt	Total	Percent (Type)
Angle	0	3	7	12	44	66	37%
Animal	0	0	0	1	1	2	1%
Fixed Object	0	3	4	9	19	35	19%
Head-On	0	1	5	2	11	19	11%
Overturn	0	0	0	1	0	1	1%
Rear-End	0	0	5	7	14	26	15%
Same Direction Turning	0	0	3	0	6	9	5%
Sideswipe	0	0	0	3	14	17	10%
Other	0	1	2	2	1	6	3%
Total	0	8	26	37	110	181	100%

Figure 2-9 illustrates the top three most frequent crash types, plotted according to their corresponding severity. A majority of the angle related accidents only involve reportable property damage and do not involve personal injuries. All three of these crash types have a general tendency to decrease as the severity increased.

Figure 2-9: Primary Crash Types by Severity for Segment 3



Crash Types by Location

Table 2-19 summarizes the crash types by location. The unnamed columns represent the accidents that occurred between the listed intersections. The crash types used in this table are the same as those used to illustrate severity in Table 2-18.

Table 2-19: Crash Types by Location for Segment 3

Event	Bannock	Riverton	JCT I-15		Shilling		Walker	Riverton		Sexton	Judicial	Bridge	Pacific	Idaho	Alice	Francis	Allen	Park	Rich	Highland		RR Cross		Airport	Total
Angle	1	1	2	1	3	3	8	0	7	1	7	18	2	1	4	0	1	0	2	3	0	0	1	0	66
Animal	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Fixed Object	0	0	1	5	0	7	0	2	3	2	3	1	1	1	1	4	0	1	1	0	2	0	0	0	35
Head-On	0	0	0	1	0	1	0	0	1	1	3	5	0	0	4	2	0	0	0	0	0	0	1	0	19
Overturn	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Rear-End	1	2	2	4	4	1	0	2	1	0	0	2	0	0	2	0	0	0	1	0	2	1	1	0	26
Same Direction Turning	0	1	0	0	1	0	1	0	0	0	0	5	0	0	1	0	0	0	0	0	0	0	0	0	9
Sideswipe	0	0	0	1	0	2	1	0	0	1	0	2	1	0	2	1	1	0	3	0	1	0	1	0	17
Other	0	0	0	1	0	0	0	0	1	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	6
Total	2	4	5	1	8	1	1	4	3	5	4	34	5	2	5	7	2	1	7	3	5	1	4	0	18
				6		4	0	4																	1

The accidents at the Walker, Judicial, and Bridge intersections are primarily angle-related. Of those accidents, failure to yield is the principal cause at the Walker Intersection. Disregarding signals and failure to yield are the main causes for those accidents at Judicial. The contributing circumstances at Bridge include: failure to yield, inattention, and passing a stop sign/disregarding a signal

The head-on collisions at the Bridge and Alice Intersections were caused by failure to yield. The rear-end collisions in and around I-15 junction and the Shilling Intersection are primarily caused by following too close, speeding, inattention and alcohol or drug abuse.

Contributing Circumstances by Location

Table 2-20 summarizes the contributing circumstances for each accident according to location. The four most frequent causes are shown in bold font. The most common contributing circumstance in the City of Blackfoot is failing to yield. These accidents are spread out over the entire segment with peaks at the Walker, Bridge and Alice Intersections. The category labeled as 'None' represents those accidents that did not have a typical contributing circumstance.

Table 2-20: Contributing Circumstances by Location for Segment 3

Contributing Circumstance	Bannock	Riverton	JCT I-15		Shilling		Walker	Riverton		Sexton	Judicial	Bridge	Pacific	Idaho	Alice	Francis	Allen	Park	Rich	Highland		RR Cross		Airport	Total
Alcohol Impaired	0	0	1	1	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Asleep or Drowsy	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Disregarded Signal	0	0	0	0	0	0	0	0	0	0	3	2	0	0	1	0	0	0	0	0	0	0	0	0	6
Distraction In/On Vehicle	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
Drove Left Of Center	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Drug Impaired	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Exceeded Posted Speed	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Failed To Yield	1	0	0	1	0	1	5	0	3	0	2	8	1	1	4	2	0	0	2	1	0	0	0	0	32
Following Too Close	1	0	1	1	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
Hit And Run	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Improper Overtaking	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Improper Turn	0	0	0	0	0	0	0	1	1	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	5
Inattention	0	1	1	2	0	1	0	0	1	0	0	4	0	0	1	0	0	0	1	0	1	0	1	0	14
Light Defect	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2
None	0	3	2	7	6	8	4	1	5	4	6	17	2	0	7	3	1	1	4	2	1	0	2	0	86
Other	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2
Passed stop sign	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Speed Too Fast For Conditions	0	0	0	3	0	0	0	1	0	0	1	0	1	0	0	1	0	0	0	0	1	1	1	0	10
Vision Obstruction	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2
Total	2	4	5	16	8	14	10	4	13	5	14	34	5	2	15	7	2	1	7	3	5	1	4	0	181

Inattention was the contributing circumstance for 7% of the accidents. These accidents occur throughout US-91 but are most common at the Bridge intersection. Alcohol related accidents are all located before the Judicial intersection.

2.8 Traffic Origins and Destinations

A license plate survey was conducted in October 2004 for the study corridor⁶ to clarify the functioning of US-91 in the regional roadway network. Data from the survey helped to establish an estimate of the length of trips using the corridor and understand existing travel conditions. The survey was conducted at 42 locations in the study corridor. Data collected were tracked and matched; license plate numbers at each of the survey locations to determine the average and range of trip lengths using US-91.

The license plate survey found that most travel within the corridor is local with relatively short trips on US-91. The average trip length is 3.2 miles within the 42 mile-long corridor. Eighty percent of vehicles observed at one survey site did not travel to an adjacent site. Approximately 60 percent of estimated vehicle miles of travel (VMT) occur intra-site (i.e. traveling within, but not outside, of a single observation location).

Average trip lengths tend to reflect the distance between communities and appear to be shorter within communities than between communities. Trip lengths are longer at the southern end of the corridor than in the northern end, commensurate with a lower level of land use development on the Fort Hall Reservation.

Average trip lengths vary little by vehicle type. Trips by trucks or buses average 2.8 miles long, while the average trip length of autos or light trucks is 3.2 miles, 15 percent longer. In the southern portion of the corridor, and between Blackfoot and Shelley, truck travel distances are longer, around 5.8 and 10.9 miles, respectively.

Autos account for almost 92 percent of corridor VMT. Almost 40 percent of corridor's VMT occurs in the northern part of the corridor. The differences between the north and the south end of the corridor are pronounced, with the area between Fort Hall and South Blackfoot I-15 Interchange accounting for only seven percent of the total VMT.

⁶ Gary Shaff & Associates, US-91 License Plate Survey Summary Report, February 2005.

2.9 Existing Roadway Geometrics

The existing US-91 roadway geometrics are presented in this section. These characteristics were obtained from the Idaho Transportation Department's Highway Performance Management System (HPMS), field observation, corridor video log, and review of aerial photography. Throughout the corridor, the grade is classified as level terrain and the area is flat. Table 2-21 summarizes the functional classification for the US-91 corridor.

Table 2-21: Functional Classification for US 91, Siphon Road to Sunnyside Road

Mileposts	Place	Functional Class	Comments
81.580 to 83.577	Siphon Road to Reservation Road	Urban Principal Arterial	Reservation Road is the Northern Urban Limit of the Pocatello-Chubbuck Urbanized Area
83.577 to 87.858	Reservation Road to Bannock County Line, Fort Hall Indian Reservation	Rural Minor Arterial	Limits of Fort Hall Reservation are Mileposts 83.588 to 97.052, US-91 and 0.0 to 2.475, I-15B
87.858 to 97.052, US 91 0.0 to 2.4, I-15B	Bannock County Line to S. Blackfoot Interchange & Interchange to Southern Urban Limits, Blackfoot	Rural Major Collector	US 91 overlapped by I-15B from So. Blackfoot Interchange to W. Bridge Street, Blackfoot, Mileposts 0.0 to 3.659
100.700 to 104.266	Southern Urban Limits, Blackfoot, to Northern Urban Limits, Blackfoot	Urban Principal Arterial	
104.266 to 122.866	Northern Blackfoot Urban Limits to York Road	Rural Major Collector	Shelley (New Sweden Road) to York project (Key #08116), Mileposts 118.933 to 122.866 (3.94 miles) recommended for change to Minor Arterial
122.866 to 125.75	York Road to Sunnyside Road, Bonneville County	Urban Principal Arterial	

2.9.1 Siphon Road to Sheepskin Road

US-91 between Siphon Road and Sheepskin Road is a two-lane roadway that is classified as an Urban Principal Arterial between Siphon and Tyhee Roads, and a Rural Minor Arterial for the balance of this segment. The existing two-lane road consists of two 12-foot lanes and variable width shoulders on each side. The design speed varies between 40 and 60 mph. The posted speed is 50 mph from Siphon Road to Reservation Road. The posted speed changes to 55 mph from Reservation Road to the Ross Fork Creek Bridge. The posted speed decreases to 35 mph in the Fort Hall town site between the Ross Fork Creek Bridge and Sheepskin Road.

Northbound left-turn lanes exist at the US-91 intersections with Siphon Road and Tyhee Road.

Horizontal Curves

The roadway segment from Siphon Road to Sheepskin Road has four horizontal curves. These horizontal curves are located at the following intersections with US-91:

- Reservation Road milepost 83.577,
- Cemetery Road milepost 85.795,
- Ross Fork Road milepost 87.855, and
- Sheepskin Road milepost 88.876.

Vertical Curves

No vertical curves that may impede driver visibility and sight distance were observed from the video logs.

Intersection Geometry

Table 2-22 summarizes the US-91 intersection geometry throughout the corridor study area. It is based on review of aerial photography for the corridor. The intersections of US-91 with Ballard Road and Agency Road are skewed. Indian School forms a T-intersection with US-91.

Shoulders

Shoulders vary in width as well as width of shoulder area that is paved. Shoulders in this segment range from 2 to 6 feet in width, as summarized below:

Milepost 81.02 to 81.58	4 foot with 2 feet paved, 2 feet unpaved
Milepost 81.58 to 83.577	8 feet with 6 feet paved, 2 feet unpaved
Milepost 83.577 to 89.4	varies

Structures

There are four structures located in this segment:

- Tyhee Wasteway Canal located at milepost 83.379 before Reservation Road;
- Tyhee Wasteway Canal Bridge at milepost 83.724 after Reservation Road;
- Pine Lateral Canal at milepost 85.803 after Cemetery Road; and
- the Ross Fork Creek Bridge milepost 87.855 at Ross Fork Road.

Table 2-22: Observed Intersection Geometry

Segment	US-91 Intersection	Skewed	Off-Set/ Staggered	T-Intersection	Crosses UPRR
Siphon Road to Sheepskin Road	Siphon Road				
	Tyhee Road				
	Reservation Road				
	Ballard Road	Yes			
	Cemetery Road				
	Indian School			Yes	Yes
	Agency Road				Yes
Sheepskin Road to I-15 South Blackfoot Interchange	Ferry Butte Road				Yes
	Bannock Road	Yes		Yes	Yes
	Riverton Road			Yes	
	I-15 IC #89 NB			Yes	
	I-15 IC #89 SB			Yes	
I-15 South Blackfoot Interchange to Airport Road	Shilling Avenue	Yes		Yes	Yes
	Walker Street			Yes	
	Riverton Road (Blackfoot)	Yes		Yes	
	Grant Avenue			Yes	
	Broadway Avenue				
	Judicial Street				Yes
	Bridge Street				Yes
	Alice Street				Yes
	Highland-Rich	Yes			Yes
	Wooton Way			Yes	
Airport Road to New Sweden Road	Airport Road			Yes	
	Mark Lane	Yes		Yes	
	Merkley-Tanner- Hansen		Yes		Yes
	Weeding – Cottonwood		Yes	Each leg is a T-intersection)	Yes
	Wapello	Yes	Yes	Each leg is a T-intersection)	Yes
	Wapello-Firth	Yes			Yes
	Wolverine			Yes	Yes
	Firth Road				Yes
	Goshen	Yes			Yes
	Sand Creek	Yes			Yes
	Baseline	Yes			Yes
	Fir	Yes			Yes
	Locust	Yes			Yes
	Center-Taylor	Yes			Yes
New Sweden Road to York Road	New Sweden			Yes	
	Country Club	Yes			Yes
	Canyon	Yes			Yes
	Clinger	Yes		Yes	Yes
	Cotton	Yes		Yes	Yes
	York	Yes			Yes

2.9.2 Sheepskin Road to I-15 South Blackfoot Interchange

This section of US-91 between Sheepskin Road and South Blackfoot Interchange is classified as a Rural Major Collector road. The existing roadway section has two 12-foot lanes and 4-foot shoulders on each side. The design speed is 60 mph and posted speed is 55 mph through this section. This section of US-91 is located in the Shoshone-Bannock Tribes Fort Hall Reservation.

Horizontal Curves

One horizontal curve is north of Ferry Butte Road at milepost 95.009.

Vertical Curves

Vertical curves that may impede driver visibility and sight distance were observed at the Blackfoot Canal.

Intersection Geometry

As shown in Table 20, Bannock Road forms a skewed intersection with US-91, while Bannock Road, Riverton Road, and the I-15 South Blackfoot Interchange ramps form T-intersections with the highway.

Shoulders

Shoulders in this segment range from 3 to 4 feet, as shown below:

Milepost 89 to 95	3 feet paved, 1 foot unpaved
Milepost 95 to 97.052	2 feet paved, 1 foot unpaved

Structures

There are two structures in this segment of US-91:

- the Gibson Lateral Canal Bridge at milepost 94.059 after Truchot Road and
- the Blackfoot Canal Bridge at milepost 96.888 before the South Blackfoot Interchange

2.9.3 South Blackfoot Interchange to Airport Road

US-91 between the South Blackfoot Interchange to the southern urban limits of the City of Blackfoot is a Rural Major Collector. From the southern urban limits to the northern urban limits is an Urban Principal Arterial. The roadway is a two-lane rural section with two 12-foot lanes and transitions to a four-lane urban arterial section through the City of Blackfoot from Shilling Way to Airport Road. The design speed varies between 40 and 60 mph. The posted speed is 55 mph from the South Blackfoot Interchange to Shilling Way. The posted speed changes to 35 mph at Shilling Way through the City of Blackfoot until Wooton Way. The posted speed begins to increase after Wooton Way to 45 mph and then to 55 mph at milepost 102.234.

This roadway segment typically has a shoulder width of 4 feet between the South Blackfoot Interchange and Wooton Way with concrete curb and gutter through the urban section of the City of Blackfoot. The shoulder transitions to a 3-foot width from Wooton Way to MP 102.234 and transitions to 4-feet wide until Tanner Road.

The following US-91 intersections have left-turn lanes: Riverton, Walker Road, Riverton (in Blackfoot), Grant, Broadway, Judicial, Bridge, Alice, and Wooton. These locations are within the City of Blackfoot urban area.

Horizontal Curves

There are four horizontal curves in the segment of US-91 from South Blackfoot Interchange to Airport Road. These horizontal curves are at the following intersections with US-91:

- Shilling Way before entering the City of Blackfoot at milepost 99.516,
- a reverse curve at Grant Street milepost 100.585,
- a reverse curve at Allen Street milepost 101.064, and
- a curve at Airport Road milepost 102.35.

Vertical Curves

No vertical curves that may impede driver visibility and sight distance were observed from the video logs.

Intersection Geometry

As shown in Table 20, Riverton Road and Highland-Rich in the City of Blackfoot have skewed intersections with US-91. T-intersections with the highway are formed with Riverton Road, Grant Avenue, and Wooton Way.

Shoulders

Shoulders in this segment range from 0 to 4 feet in width, as summarized below:

Milepost 100.7 to 101.652	No shoulder. In City of Blackfoot with curb and gutter section
Milepost 101.652 to 101.836	3 foot paved
Milepost 101.836 to 102.45	4 feet with 3 feet paved, 1 foot unpaved

There are no structures located in this segment.

2.9.4 Airport Road to New Sweden Road

This section of US-91 is classified as a Rural Major Collector. This existing road consists of two 12-foot lanes and variable width shoulders on each side. The design speed varies between 30 and 60 mph. The posted speed is 55 mph between Tanner Lane and Garfield, and Firth to Baseline Road. The urban sections through the cities of Firth and Shelley have posted speeds between 25 and 35 mph. The roadway in the City of Firth has concrete curb and gutter. The roadway beginning at Fir Street in Shelley, proceeding north has four 12-foot lanes and 3-foot shoulders.

US-91 has left turn lanes at the intersections with Airport Road, Firth, Fir Street, Center Street and New Sweden Road.

Horizontal Curves

This segment has three horizontal curves located at the following intersections with US-91:

- Kimball Road milepost 109.440,
- Firth Road milepost 112.507, and
- Fir Street milepost 117.708.

Vertical Curves

Vertical curves that may impede driver visibility and sight distance were observed at the Corbett Slough Canal (milepost 103.363), West Blackfoot Canal (milepost 109.596), Blackfoot Canal (milepost 113.255), Reservation Canal (113.59), and Cedar Point Canal (milepost 114.732).

Intersection Geometry

As shown in Table 20, skewed intersections with US-91 are located at Mark Lane, Wapello Road, Wapello-Firth Road, Goshen Road, Sand Creek Road, Baseline Road, and Fir, Locust and Center-Taylor Streets in the City of Shelley.

Merkley-Tanner-Hansen, Weeding-Cottonwood, and Wapello Road are also offset with each leg forming a T-intersection with US-91. Airport Road, Mark Lane, and Wolverine also form T-intersections with the highway.

Shoulders

Shoulders in this segment range from 0 to 5 feet in width as summarized by milepost below:

Milepost 102.45 to 104.266	5 feet with 4 feet paved, 1 foot unpaved
Milepost 104.266 to 107.289	4 feet paved
Milepost 107.289 to 111.9	3 feet paved

Milepost 111.9 to 113.3	No shoulder
Milepost 113.3 to 117.1	5 feet paved
Milepost 117.1 to 117.998	3 feet paved
Milepost 117.998 to 118.99	No shoulder
Milepost 118.99 to 120.561	5 feet paved

Structures

There are five structures located in this segment:

- Corbett Slough Canal Bridge milepost 103.363,
- West Blackfoot Canal Bridge milepost 109.596,
- Blackfoot Canal Bridge milepost 113.255,
- Reservation Canal Bridge milepost 113.590, and
- Cedar Point Canal Bridge milepost 114.732.

2.9.5 New Sweden Road to Sunnyside Road

US-91 between New Sweden Road and Sunnyside Road is classified as a Rural Major Collector from Country Club Road to York Road and an Urban Principal Arterial from York Road to Sunnyside Road. The posted speed is 55 mph throughout the section with a design speed of 60 mph. The roadway consists of two 12-foot lanes with 3-foot shoulders between New Sweden Road and York Road. The lane configuration is four 12-foot lanes between York Road and Sunnyside Road with 6-foot shoulders.

US-91 has left turn lanes at its intersections with New Sweden Road, Country Club Road, York Road and Sunnyside Road.

Horizontal Curves

There are no horizontal curves located in this segment of US-91.

Vertical Curves

Vertical curves that may impede driver visibility and sight distance were observed at the Snake River Valley Canal (milepost 120.226).

Intersection Geometry

As shown in Table 20, Country Club Road, Canyon Road, Clinger Road, Cotton Road and York Road have skewed intersections with US-91. New Sweden Road, Clinger Road, and Cotton Road are also T-intersections.

Shoulders

Shoulders in this segment range from 1 to 4 feet paved, as summarized by milepost below:

Milepost 120.561 to 122.866	4 feet paved
Milepost 120.561 to 125.175	1 foot paved

Structures

There is one structure located in this segment, the Snake River Canal Bridge at milepost 120.226.

2.10 Existing Structures

The majority of structures on US-91 are bridges across irrigation canals. Most have narrow shoulders such that the total roadway cross-section is narrow. Table 2-23 summarizes information obtained from ITD Division of Planning for structures.

Table 2-23: Structures Sufficiency Ratings

Roadway Segment	Milepost	Structure Name	Bridge Key #	Width (feet)	Sufficiency Rating	Material Type/Design Type/Year Built
Siphon Road to Sheepskin Road	83.38	Tyhee Wasteway Canal	17500	34	76.3	Concrete/ Frame/ 1925
	83.72	Tyhee Wasteway Canal Bridge	17505	34.4	96.4	Concrete/ T-Beam/ 1925
	85.80	Pine Lateral	17510	86	87	Concrete/ Frame/ 1925
	87.86	Ross Fork Creek Bridge	17515	34.4	96.7	Concrete/ T-Beam/ 1925
Sheepskin Road to I-15 South Blackfoot Interchange (I.C.)	94.06	Gibson Canal Bridge	17520	34.4	81.5	Steel/Stringer-G/ 1923
	96.89	Blackfoot Canal	17525	41.3	98.2	Concrete/ Frame/ 2004
I-15 South Blackfoot I.C. to Airport Road	I-15B 1.8	Northside Canal Bridge	12085	34.5	86.9	Concrete/Culvert/1950
	I-15B 2.48	Blackfoot River Bridge	12090	49.0	94.3	Concrete T-beam/1936
Airport Road to New Sweden Road	103.36	Corbett Slough Canal Bridge	17530	34.4	77.2	Concrete/ T-Beam/ 1926
	109.60	West Blackfoot Canal Bridge	17535	34.4	81.8	Concrete/ T-Beam/ 1951
	113.26	Blackfoot Canal Bridge	17540		81.1	Concrete/ T-Beam/ 1951
	113.59	Reservation Canal Bridge	17545	48	98.6	Prestressed Concrete/Slab/ 2000
	114.73	Cedar Point Canal Bridge	17550	58.3	98.2	Concrete/ Frame/ 2004
New Sweden Road to York Road	120.27	Snake River Valley Canal Bridge	17555	32.2	48.4	Concrete/ Slab/ 1941
York Road to Sunnyside Road		No structures.				

The sufficiency rating quantifies the condition of a bridge and its ability to meet current needs. Each bridge in the State is inspected at least every two years and given a sufficiency rating of 0 to 100, with 100 representing a "perfect" bridge. Bridges with sufficiency ratings below 50 are classified as structurally deficient or functionally obsolete and are eligible for federal replacement funds. The Snake River Canal Bridge is deficient as it has a rating below 50.

Users of US-91 reported that the narrow bridge crossings are an impediment to passage of wide agricultural vehicles. Wide vehicles must encroach into the opposing lane in order to pass between the bridge abutments. The three structures that have been replaced between 2000 and 2004 have been built with a wider cross-section that will better accommodate wider vehicles.